EA No. ID-070-00-053
EA No. ID-010-00-053

STRATEGIES

FOR

GRASSHOPPER/MORMON CRICKET CONTROL

ENVIRONMENTAL ASSESSMENT

for

UPPER SNAKE RIVER DISTRICT
and
LOWER SNAKE RIVER DISTRICT

BUREAU OF LAND MANAGEMENT

IDAHO

March 2000

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NEED FOR THE PROPOSED ACTION

The Bureau of Land Management (BLM) continues to need to implement an integrated grasshopper/ Mormon cricket control program in cooperation with the United States Department of Agriculture, Animal and Plant Health Inspection Service (APHIS). Extreme grasshopper population increases can occur during years favorable to their survival. High numbers of grasshoppers have caused and will continue to cause significant damage to agricultural crops adjacent to public lands. Grasshopper control is considered to be a beneficial program and is accepted by the public in the State of Idaho.

The BLM's Upper Snake River District (USRD) and Lower Snake River District (LSRD), propose to implement a crop protection program consistent with the USDA Animal and Plant Health Inspection Service (USDA-APHIS) Rangeland Grasshopper Cooperative Management Program Record of Decision dated April 20, 1987. This action meets the Purpose and Need set forth in the Rangeland Grasshopper Cooperative Management Program Final EIS of March, 1987 (APHIS FEIS 87-1). A copy of this document is available at the USRD District Office for inspection.

This Environmental Assessment (EA) supports, and is an extension of, the Memorandum of Understanding between USDA and United States Department of Interior (USDI) dated 5-9-86 for the management of grasshoppers and Mormon crickets on lands administered by USDI; and the Inter-Agency Agreement (1422DAI990006, 1999/2000) between USDA and USDI for the treatment of range pests on BLM lands in Idaho.

DESCRIPTION OF THE PROPOSED ACTION

Integrated Pest Management (IPM) was identified as APHIS' preferred alternative in APHIS FEIS 87-1, was approved in APHIS' record of decision for that EIS, and is the primary basis for the Proposed Action in this EA. Operational design features and mitigation measures relating to grasshopper control activities are presented in Tables 2-1 and 2-2 of APHIS FEIS 87-1. These tables are presented in Attachment 1 (page 43) and are incorporated into this Proposed Action. IPM includes chemical and biological controls, research on cultural/mechanical methods, data base development based on surveys to enhance outbreak prediction capabilities, and environmental monitoring. IPM allows for the flexibility necessary to deal with populations of grasshoppers and Mormon crickets that threaten cropland adjacent to infested rangeland. Although only malathion, carbaryl sprays, carbaryl bait, and *Nosema locustae* (a protozoan species specific to grasshoppers) were directly addressed in the EIS, IPM allows for the use of all operational available control methods and the integration into the program of new strategies as they develop and become available.

Although application of *Nosema locustae* included as part of the IPM program, *Nosema* is no longer readily available and therefore it is not expected to be used under the Proposed Action.

Acephate as a chemical spray is no longer labeled for rangeland use since its registration has not been kept current. Very little use of this chemical for control of grasshoppers in Idaho has taken place. Because it can no longer be used its use will no longer be considered.

A new chemical developed after the 1987 EIS was prepared is the insect growth regulator diflubenzuron. It is sold under the trade name Dimilin 2L (EPA Reg. No. 400-461). This chemical is included in the Proposed Action, to be used on public lands in Idaho for the control of grasshoppers and Mormon crickets where appropriate and subject to the standard operational procedures identified below and the Table 2-1 - Operational Procedures (page43) from the FEIS. Diflubenzuron (the active ingredient in Dimilin 2L) is a growth regulator that affects the formation and/or deposition of chitin in an insect's exoskeleton. When an insect larva or nymph is exposed to Dimilin 2L, the exoskeleton is weakened and the larva/nymph is unable to successfully molt. Included by reference into this EA is the information contained in APHIS' Chemical Risk Assessment for Diflubenzuron Use in Grasshopper Cooperative Control Program, March 2000. This risk assessment discusses in detail Dimilin 2L application rates, methodology, and potential environmental effects.

Dimilin is many times less toxic to terrestrial species and does not kill all species of insects. Malathion when compared to the use of Dimilin, applied in standard or Reduced Agent and Area Treatments (RAATs) (Attachment 3) application (sprayed in strips covering only 50 percent of the ground) represents approximately a 170 to 210 fold greater risk to mammals, a 260 to 330 fold greater risk to birds, a 77,000 to 97,000 fold greater risk to fish, and 11,000 to 14,000 fold greater risk to bees (Lockwood, 1999). Lockwood (1999) also found that compared to the proposed use of Dimilin, carbaryl in standard or RAATs applications represents a 220 to 430 fold greater risk to mammals, a 90 to 180 fold greater risk to birds, a 3,100 to 6,200 fold greater risk to fish, and a 2,400 to 4,900 fold greater risk to bees.

Dimilin 2L is applied at a recommended rate of 0.5 to 1.0 fluid ounce per acre, and applications may not exceed 1.0 fluid ounce per acre per year. Applications may be made anytime after grasshopper/Mormon cricket eggs begin to hatch with optimum results attained when the majority of nymphs have reached the second and third instar stage of development. Applying Dimilin 2L when grasshopper/Mormon crickets have reached the adult stage is ineffective. Dimilin 2L remains active on foliage for approximately one month and will continue to control grasshoppers/Mormon crickets that hatch later in the season. Dimilin 2L label instructions require that it not be applied within 500 feet of endangered aquatic invertebrates and prairie potholes containing water, or within 110 feet of temporary streams, ponds, and areas where surface water is present. The effects of Dimilin 2L on grasshoppers may not be seen until 3 to 7 days after treatment

A new method of chemical control for rangeland grasshoppers has been developed in which the rate of insecticide is reduced from traditional levels and untreated swaths (refuges) are alternated with treated swaths. This new strategy is called RAATs. RAATs works through chemical control, meaning grasshoppers are killed in treated swaths, and conservation, biological control, which allows predators and parasites preserved in untreated swaths to suppress grasshoppers. This integrated pest management can reduce the cost of control up to 50 percent. BLM is including this method of treatment in the preferred action. Less insecticide in the environment lowers the risk to native species (including fish and wildlife), water quality, and humans. Untreated swaths provide a refuge for organisms with lower mobility than grasshoppers, and even those organisms that move into treated swaths will be largely unaffected unless they feed on foliage.

The density of eight adult grasshoppers per square yard is used as the minimum population at which a control program is considered. In response to requests for treatment, APHIS/BLM would determine if an infestation of an economically critical level (eight or more grasshoppers per square yard) were present in the area of concern. Appropriate treatment would then be determined taking into account site-specific environmental factors.

Under the Proposed Action, the chemicals directly addressed in the 1987 FEIS (excluding acephate) and Dimilin 2L would be used in a crop protection program across southern Idaho. Although malathion can be used, it is the least desirable chemical because of its broad spectrum of impacted species and the potential impacts on the environment. Treatment would be done in the most effective manner as determined by on-the-ground surveys and consultation between APHIS and BLM personnel. Each treatment project would be designed to provide for crop protection, subject to the standard operational procedures identified below. The location of treatment areas would generally be in strips of public lands not more than one-half mile wide, adjacent to agricultural cropland. Treatments up to 1 mile may be authorized based on the table in the Alternatives section. All treatments would be considered on a case-by-case basis.

STANDARD OPERATIONAL PROCEDURES for the Proposed Action include the following:

1. Only EPA approved chemicals authorized for the control of grasshoppers and Mormon crickets would be allowed when grasshopper infestations are of economic concern (8 or more per square yard).

2. A five hundred foot buffer zone would be maintained around all crops for which the insecticide being applied is not registered.

3. Application would not be made on municipal watersheds unless specifically requested in writing by the local governing bodies.

4. Chemicals would be applied by a licensed commercial applicator and in accordance with label directions.

5. Application would not be made directly to any water body, on humans, residences, livestock, permitted apiaries, or automobiles.

6. Field Managers will review each site specific request for control to determine if additional environmental protective measures are needed.

7. Application will not be made in areas where biological control agents have been released to control noxious weeds and a buffer of 300 feet will be maintained from these areas

Grasshopper and Mormon cricket populations are cyclical and it is difficult to estimate what an average treatment year is. Control measures can run from no treatments in one or more consecutive years to treatments possibly as large as 70,000 acres in size.

Table 1 (page 22) ; Table 2 (page 27); and the Protective and Mitigation Measures (page 29) will be used for species specific protection.

ALTERNATIVES

Preferred Alternative for Least Impact to Non-target Species: Provides crop protection and minimizes risks to non-target fish, wildlife and plant species of concern. Emphasizes use of Dimilin and carbaryl bait for control. Carbaryl spray would be used when treatment with Dimilin has been ineffective, or when treatment with Dimilin is determined to be untimely or inappropriate due to State regulatory protocols. Malathion spray would be authorized when carbaryl treatment has been ineffective on habitat types where there is a very low probability that significant numbers of sensitive species would occur.

Components:

1. Use Dimilin in a proactive, preventive mode by approving early application to known or suspected high infestation areas. The area treated generally would be ½-mile from crop edge using strip application technique (RAATs). Treatments up to 1 mile may be authorized on areas shown in the table below.

2. The following table displays the proposed treatment and treatment areas for the chemicals to be used for grasshopper and Mormon cricket control. We will use the following definitions:

   Shrub-steppe: Sites with more than 5% shrub cover in the proposed treatment area.

Grassland: Annual or seeded grass-dominated sites with 5% or less shrub cover in the proposed treatment area.

Chemical	Treatment Area Characteristics	Proposed Treatment
Dimilin 2L applied at rate of 1 ounce active ingredient (a.i.) per acre	Grasslands[1]	Generally ½ mile strip but could go up to 1 mile Use RAATs methodology
	Shrub Steppe[1]	½ mile strip from crop edge Use RAATs methodology
Carbaryl bait 5% (0.5 pounds a.i.) - applied at rate of less than 10 pounds treated bait per acre	Grasslands	Generally ½ mile strip but could go up to 1 mile where dimilin treatments have been ineffective or untimely. Use RAATs methodology
	Shrub steppe	After July 15 bait could be used up to ½ mile from crop edge where dimilin treatments were ineffective or not used. Use RAATs methodology
Carbaryl spray applied at rate of 0.5 pounds a.i. per acre	Shrub steppe	No Treatment
	Grasslands	Generally ½ mile strip but could go up to 1 mile where dimilin treatments have been ineffective or untimely. Use RAATs methodology

Chemical	Treatment Area Characteristics	Proposed Treatment
Malathion applied at rate of 0.58 pounds (8 ounces) a.i. per acre	Shrub steppe	No Treatment
	Grasslands	Generally ½ mile strip but could go up to 1 mile where dimilin and carbaryl treatments have been ineffective. Use RAATs methodology

[1] Unless Dimilin is approved for the crop, a 500 foot setback will be used.

3. Above applications are subject to the species-specific or area-specific restrictions in Tables 1 and 2 (pages 22 and 27).

4. Monitoring by APHIS would include documentation of what, where and how grasshopper control was implemented. Documentation would include the request form filled out by BLM offices implementing the control activities. Impacts to non-target species will be documented as part of the monitoring process.

5. No treatments will be authorized within Bull Trout occupied drainages (Little Lost River watershed, Jack Creek and Dave Creek in the South Fork of the Boise River above the Anderson Ranch Dam, and in tributaries of the Snake River, Indian Creek and Wildhorse River).

No Action Alternative

The alternative of No Action was analyzed in APHIS FEIS 87-1 and considered in the Record of Decision (ROD) for that EIS. Although No Action would avoid the potentially adverse effects of chemical treatments on non-target species, it would not address the problem of devastating crop damage that would result from major infestations of grasshoppers and Mormon crickets. If no treatment is conducted in 2000, the loss of crops in Idaho is estimated to be $8 million. This estimate is based on a percentage of the $45 million value of the crops grown along the 400-mile edge between cropland and public rangeland that was treated in 1999. Because this alternative was adequately addressed in the 1987 EIS, it will not be discussed further in this EA.

Use Only Treatments Analyzed in the 1987 EIS

This alternative would allow for the use of only those chemicals specifically approved in the ROD for APHIS EIS 87-1. The EIS analyzed in detail the alternatives of No Action, Chemical Control Only, and Integrated Pest Management. The ROD selected Integrated Pest Management, which provided for the use of all identified treatments. The EIS included detailed analysis for the approved chemicals (malathion, carbaryl, and acephate); however, it did not directly address the use of Dimilin 2L (EPA Reg. No. 400-461), which has been developed after the EIS was prepared. The Proposed Action does include the use of Dimilin 2L, in addition to the treatments analyzed in the 1987 EIS. In other words, the analysis in this EA specifically covers the treatments in the EIS and the use of the new chemical Dimilin 2L. Because Dimilin 2L has advantages over other chemicals in certain situations, it is considered logical and reasonable to provide for its use in this EA. Therefore, the alternative of using only the treatments analyzed in the 1987 EIS will not be analyzed as a separate alternative in this EA.

Spray Large Blocks of Public Lands

Another alternative strategy for controlling grasshoppers and Mormon crickets would be to spray approved pesticides on large blocks (more than 10,000 acres) of public lands where infestations develop, regardless of whether the blocks were adjacent to cropland. Although this alternative would be expected to kill more grasshoppers and Mormon crickets, it has several overriding disadvantages:

1) Considering the spraying cost of several dollars per acre, this alternative would be very expensive and would not be the most effective use of limited funding;

2) The purpose of the grasshopper/Mormon cricket control program is for crop protection, and the populations causing damage to the crops are generally within half a mile of the cropland; and

3) Spraying large blocks of public lands would kill more non-target species and greatly increase the risk of harming special status species.

The Proposed Action allows for flexibility in designing treatment projects to include concentrations of grasshoppers or Mormon crickets that pose a threat to cropland; however, in most cases the treatment projects will be located in strips not more than a half-mile wide, adjacent to agricultural crops. Because of the flexibility in the Proposed Action and the obvious disadvantages and infeasibility of spraying large blocks of public lands, this alternative will not be discussed further in this EA.

Improve Public Rangeland Conditions

This alternative would involve improving vegetation conditions on public lands as an option for reducing infestations of grasshoppers and Mormon crickets on public lands adjacent to croplands. Some research indicates that over the long term BLM may be able to decrease grasshopper/Mormon cricket infestations through good range management. Research in North Dakota studied the use of a grazing system to alter structure and density of vegetation and cause negative impacts on grasshopper populations (Manske 1995). The grazing system was compared to a 5- or 6-month season-long grazing strategy. The changes in vegetation retarded development of nymph grasshoppers, decreased longevity of adult grasshoppers, and reduced the number of living grasshoppers. The basic premise of the approach was that most rangeland pests (e.g., grasshoppers) are favored by open canopy and bare ground.

Another factor is that extensive areas of BLM land lack sagebrush. This condition influences the bird numbers and species in these area. Fowler et al (1991) found that birds in North Dakota reduce grasshopper populations by 33%. Joern (1986) in Nebraska found grasshopper densities were 30-50% higher in treatments where birds were excluded. McEwen et al (1991) asserted that avian predation on grasshoppers is significant as a biotic control factor and is an important preventive of grasshopper outbreaks on good condition native rangeland with a healthy vertebrate component. If we have healthy rangelands (including sagebrush) we should depress grasshopper numbers.

Unfortunately, improvement of rangeland condition and restoration of sagebrush is a long-term process. Although BLM is continuing to assess and adjust livestock grazing and is increasing efforts to restore native vegetation, including sagebrush, these are long-term management actions requiring substantial time to produce significant results. Whereas these management actions will continue to be pursued and may help control grasshopper/Mormon cricket infestations in the long-run, they do not address the imminent threat posed by the infestation expected this year. Therefore, this alternative for grasshopper/Mormon cricket control will not be addressed further in this EA.

AFFECTED ENVIRONMENT

The sagebrush/grass complex of rangelands across south central and eastern Idaho, bordering private crop land, are the environment that would be potentially affected for grasshopper/Mormon cricket control. Many of these rangelands are semiarid to arid and are grass-like plants, forbs, or shrubs that have livestock grazing authorized under some type of managed system. Topography, climate, soils, vegetation, wildlife, water resources, and cultural resources will vary depending on their location across the State. These rangelands host a variety of wildlife species several of which must be watched closely. The proposed project is believed to either contain suitable habitat, or cause changes that may affect the behavior or physiological processes of some Federally listed Threatened or Endangered species or BLM Sensitive animals or plants. These species are listed in Table 1 (page 22) and Table 2 (page 27) for animals and plants respectively. The following contains a brief description of

the general use area and the relative likelihood of impacts from the proposed and historical treatment areas.

Listed Endangered or Threatened Species

The proposed project area contains suitable habitat for some Federally listed Threatened, Endangered or Candidate species, or BLM Sensitive animals or plants.

Bald Eagle

The bald eagle is listed as a threatened species in all contiguous 48 States. Bald eagle habitat in south central and southeast Idaho is located along the South Fork, the Henry's Fork and the main Snake River downstream to the western border of the project area at King Hill Creek. The South Fork, Henry's Fork and main Snake River is considered year long habitat with the majority of the eagles present during the winter months. There are active bald eagle nests on all of the forks of the Snake River. Some immature birds have been seen at American Falls Reservoir during early spring nest occupancy flights. The remainder of the main Snake River area only contains bald eagles during the winter period. The only other nest location is in western southern Idaho on the Cabarton stretch of the Payette River. No likely grasshopper control areas lie near this nest site.

Whooping Crane

The whooping crane is listed as an Experimental, Nonessential population for Idaho under the Endangered Species Act (ESA). While many of the males return to Gray's Lake National Wildlife Refuge, the sub adults and adult females tend to utilize meadow areas in western Wyoming, eastern Idaho, and southwestern Montana. So, much of the use by this population is neither on National Wildlife Refuges nor designated critical habitat. Some birds show fidelity to these high meadow summering areas while others may tend to drift from place to place. There is potential for the proposed program to directly treat those areas where whooping cranes may be summering particularly in eastern Idaho. Migration routes for the crane are outside classical grasshopper treatment areas.

Bull Trout

Bull trout have been listed as threatened under the ESA. In the USRD, bull trout are known to occur in the Little Lost River watershed. Sawmill and Wet Creek are considered key bull trout sub-watersheds. Often occupied reaches include all of the main stem of the Little Lost River, Williams Creek, Badger Creek, Summit Creek, and Sawmill Creek. Lime Creek, in the northwest corner of the USRD is suspected to contain bull trout. Recent investigations have failed to find any bull trout on public land in the Lime Creek drainage.

In the LSRD Bull trout are found in the Jarbidge River and its tributaries (Jack Creek and Dave Creek) in the South Fork of the Boise River above the Anderson Ranch Dam, and in tributaries of the Snake River (Indian Creek and Wildhorse River) within the Jarbidge Field Office.

Ute Ladies'-Tresses

Ute ladies'-tresses is listed as threatened under the ESA. This perennial orchid occurs in mesic or wet meadows and riparian/wetland habitats formed by springs, seeps, lakes, and streams from 1,500 to 7,000 feet in elevation. It is presently known from Colorado, Montana, Nebraska, Utah, Washington, Wyoming, and eastern Idaho along the South Fork of the Snake River between Swan Valley and the confluence with the Henry's Fork. The South Fork populations were first discovered in 1996. A total of 22 occurrences of Ute ladies'-tresses are currently known from Idaho (Moseley, 2000). Surveys adjacent to the South Fork of the Snake River and other portions of the state have failed to discover additional Ute ladies'-tresses populations outside of the South Fork of the Snake River (Moseley, 1997, 1998a, 1998b, and 1999). The FWS considers the entire state of Idaho to be within the potential range of this species. Large and long-tongued bumblebees (*Bombus morrisoni* and *B. fervidus*) are the most important pollinators of Ute ladies'-tresses orchid (Sipes and Tepedino 1995a).

Banbury Springs Limpet, Bliss Rapids Snail, Utah Valvata Snail, Idaho Springsnail and Snake River Physa Snail

These five listed molluscs either occupy aquatic habitat found in select springs or they occur on substrate in the main stem Snake River. The Banbury Springs limpet is known to occur at three sites in the Thousand Springs area near Hagerman, Idaho. It has only been found on cobble or boulder substrates in cool, clear, well-oxygenated water. All known populations have occurred in swift currents. The Bliss Rapids snail has primarily been found on cobble-boulder substrate in flowing reaches of the main stem Snake River and alcove springs (Federal Register 1992). River populations have been found in spring-influenced habitat or near the edge of rapids. Most populations occur in the Hagerman Reach, the tailwaters of Bliss and Lower Salmon Falls dams, large alcove springs, and springs on the Fort Hall Indian Reservation upstream of American Falls Reservoir. The Utah valvata snail occurs in deep pools with a mud or sand substrate adjacent to rapids or in large perennial spring complexes. This snail has been found in a few springs and main stem Snake River sites in the Hagerman Valley, below American Falls downstream to Burley, Idaho and in the Lake Walcott and Minidoka Dam area. The Idaho springsnail and the Snake River Physa snail are both main stem Snake River species which occur in a relatively short segment of the Snake River in the western portion of the proposed treatment area.

Grizzly Bear

The grizzly bear has been Federally listed as a Threatened species. Habitat for the bear in the project area is primarily in the Island Park area or extreme Northeastern portion of the District. BLM policy is to treat BLM lands the same as the adjacent Forest Service lands in regard to the bear. The acreage is relatively small but it could be important for a recovered population of bear.

Gray Wolf

The gray wolf has been determined to be an endangered species. The wolf ranges along the continental divide on the northern edge of the Idaho Falls Field Office and into the Island Park area around Yellowstone National Park (YNP). Rare, infrequent sightings of gray wolves have been made in the northern one-half of the Upper Snake River District. There is an experimental, non-essential population of wolves in YNP and in the Lower Snake River District and the Shoshone Filed Office. This species has not been documented as occurring on the lands managed by the Idaho Falls Field Office although the wolves in YNP could follow the elk out of the park and be found on the elk wintering range.

Canada Lynx

On March 24, 2000 the U. S. Fish and Wildlife Service listed the Canada lynx as a Threatened species under the ESA of 1973, as amended. This will take effect on April 24, 2000. The proposed treatment areas may contain habitat conditions suitable for Canada lynx foraging, movement and dispersal activities. In Idaho, lynx are thought to primarily occur in the higher elevation cold forest habitats which support spruce, subalpine fir, whitebark pine and lodgepole pine (Ruggiero et al. 1994, Maj and Garton 1994, Groves et al. 1997). Shrub/steppe habitats which occur adjacent to, or are intermixed with, cold forest habitats in Idaho are thought to be used to a limited extent by lynx for foraging and dispersal activities. None of these habitat conditions or vegetation communities occur on or adjacent to the area addressed in this analysis.

Proposed Species

Northern Idaho Ground Squirrel

The Northern Idaho ground squirrel is found on shallow rocky soils in dry meadows surrounded by Ponderosa pine and Douglas-fir forests in Valley and Adams Counties. Seeds and green vegetation make up the diet of this squirrel. Northern Idaho ground squirrel habitat is not found adjacent to crop land.

Candidate Species

Columbia Spotted Frog

The Columbia spotted frog is found in small ponds and in the quiet water sections of low gradient streams in the Owyhee Mountains in southwestern Idaho. A small sub-population is found in two small streams along the Idaho/Nevada border southwest of Rogerson, Idaho. Grasshoppers are a likely prey item for this frog.

Slickspot Peppergrass

Slickspot peppergrass was included on the federal candidate list in 1999. This annual or biennial forb occurs in sagebrush-steppe habitats in southwest Idaho, where it typically grows on microsites known as "slick spots." It is presently known from 45 sites in Ada, Canyon, Elmore, Gem, Owyhee, and Payette counties. Many of these sites are adjacent to agricultural lands that have previously been sprayed, especially in the Kuna area. The pollinators of slickspot peppergrass are unknown. Gravity, wind, and water are all believed to play at least some role in seed dispersal. It is possible that ants do as well, since slickspots are occasionally associated with anthills

Species Under Review by U.S. Fish and Wildlife Service or Petitioned For Listing as T&E

Columbian Sharp-tailed Grouse and Sage Grouse

Both of these grouse species are BLM listed sensitive species. The Columbian sharp-tailed grouse has been petitioned for listing under the ESA. Young grouse hatch in the spring at about the same time as grasshopper or Mormon cricket populations begins to increase. Insects are a critical source of protein for the young birds. Large grasshopper or Mormon cricket populations are common in the critical habitat of both species. In the LSRD historical grasshopper control areas are not found adjacent to sage or sharp-tailed grouse habitat use areas.

Southern Idaho Ground Squirrel

The Southern Idaho ground squirrel inhabits low rolling hills and valleys now dominated by annual grasses and exotic weeds, with relic areas of sagebrush and native bunch grasses. Historic bottomland habitat has largely been converted to farm or pasture land. The current range of this squirrel lies south of Council, Idaho, north and east of Weiser, Idaho, south and east of Midvale, Idaho. Recent surveys have revealed a dramatic decline in population numbers for this animal. Existing habitat is not identified within historic grasshopper treatment areas.

Bonneville Cutthroat Trout and Yellowstone Cutthroat Trout

Both the Bonneville cutthroat trout and Yellowstone cutthroat trout are currently petitioned for listing as threatened under the ESA. The Bonneville cutthroat trout is limited to the Bear

River watershed. The Yellowstone cutthroat trout is believed to occupy a number of streams scattered across the USRD. Their current distribution is under investigation.

Mulford's Milkvetch, Woven-Spore Lichen, and Malheur Princesplume

Mulford's milkvetch and Woven-spore lichen are currently under review by the FWS for listing as federal candidate species. Mulford's milkvetch is endemic to southwest Idaho and extreme southeast Oregon, where it grows in deep sandy soils. It is typically associated with bitterbrush, needle-and-thread grass, and Indian ricegrass. In Idaho, Mulford's milkvetch is known from Ada, Owyhee, Payette, and Washington counties. While no information is available regarding its pollination biology, Mulford's milkvetch is believed to be insect pollinated. Seed dispersal is most likely by gravity and wind. Woven-spore lichen grows on humus in sagebrush-steppe habitats in southwest Idaho, central Oregon, and southern Washington. Several localities are also known from southern California. Woven-spore lichen has been found at 14 localities in Idaho, all within Ada and Elmore counties. Most of the sites are adjacent to or are surrounded by private land. Nothing is known of its reproductive or dispersal mechanisms.

The FWS will be initiating a status review for Malheur prince's-plume in 2000. This showy, three foot tall biennial plant species is known from six widely scattered localities in Gooding, Owyhee and Washington counties in southwest Idaho. It grows only on sparsely vegetated clay soils. Approximately 15 populations of Malheur prince's-plume are known from southeast Oregon in Harney and Malheur county. A variety of bees and beetles have been observed visiting the flowers, but no pollination studies have been conducted.

Special Status Species Identified by BLM or IDFG and Species of Concern Identified by FWS

Western Burrowing Owl

The Western burrowing owl is common in grasslands and open sagebrush steppe habitat as well as in waste areas adjacent to roads and farms. It frequently uses badger holes for nest burrows. Food for this owl consists largely of insects such as grasshoppers, locusts, and beetles, and small rodents.

Pygmy Rabbit

This rabbit is typically found in dense stands of big sagebrush growing on deep loamy soil. Big sagebrush, grasses and forbs are the primary sources of food. Much of the habitat in southern Idaho has not been surveyed for this species.

Townsend's Big Eared Bat, Spotted Bat, Western Small-footed Myotis, Long Eared Myotis, Fringed Myotis, Long-legged Myotis, Western Pipistrelle, and Yuma Myotis

All of the above bats are sensitive species which may spend part of their life history foraging near agricultural lands. Primary foods include night flying moths and other insects. Foraging habitat varies among the species from shrub steppe to meadows, riparian corridors, and over ponds and lakes. The Townsend's big eared bat is known to avoid open, grazed pasture lands (Idaho State Conservation Effort, 1995). Habitat used for roost is highly variable with this group of bats. Some use cracks and crevices in cliffs and canyons for roosts while others may use buildings, bridges, and tree cavities. The Townsend's big eared bat, which may be the best studied in Idaho, exclusively uses mine tunnels and caves for maternity and hibernation colonies. Although the spotted bat and Townsend's big eared bat prey on moths and other flying insects, some of the others will capture insects on the ground.

Northern Harrier

The Northern harrier is found in marshes, meadows, grasslands, shrub steppe and cultivated fields. It nest on the ground. Prey items include small mammals, reptiles, amphibians and large insects.

Loggerhead Shrike, Gray Flycatcher, Brewer's Sparrow, Grasshopper Sparrow, and Sage Sparrow

The above species are tied to shrub steppe habitat for nesting and foraging. Grasshoppers and crickets make up a portion of each species diet. Large numbers of insects are caught by these species to feed chicks during the nesting period. Unlike the other shrub steppe birds in this group, the Loggerhead shrike will also prey upon small birds, lizards and rodents.

Kit Fox

The Kit fox is generally believed to be an extirpated species in Idaho. The only recent observation of sign that this species is still in Idaho was an observation by Idaho Power Company biologists several years ago. They believe that a kit fox visited a scent post set up during and inventory project within the Snake River canyon, between the Bliss Dam and Hagerman, Idaho. The kit fox is an opportunistic predator eating small mammals, reptiles and insects.

Western Ground Snake, Longnose Snake, Common Garter Snake, Short-horned Lizard, Mojave Black-collared Lizard

The Longnose snake is usually found near the Snake River in sandy soils often associated with greasewood shrubs. This snakes diet is believe to include small rodents and insects. The Common garter snake is found stream or riverside and on pond and lake edges. It principally eats small fish. The short-horned lizard is an animal of the sagebrush shrub steppe country. Some insects are eaten by this lizard but the principle food item is the harvester ant. The short-horned lizard is rarely found near crop lands. The Mojave black-collared lizard is one of the largest lizards found in southern Idaho. Habitat generally consists of boulder fields or raised blocks of sedimentary rock. Surrounding vegetation can vary from sagebrush shrub steppe to saltbush/bud sagebrush plant communities. Insects and smaller lizards are the chief prey items for this predator.

Western Toad, Woodhouse's Toad, and Northern Leopard Frog

The western toad is found in a wide variety of habitats such as springs, stream, meadows, woodlands, and around ponds, lakes, reservoirs, and slow-moving streams and rivers. Adult toads eat spider, insects, sowbugs and earthworms. The Woodhouse's toad is found adjacent to agricultural lands, in grasslands, forests, shrub steppe and river and stream valley bottoms. Diet of this species includes insects, spiders and crustaceans. Leopard frog inhabit steams, ponds, marshes, slow steams, reservoirs and lakes. Invertebrates make up a large portion of the diet of new metamorphs. Adults eat other small frogs, snakes, fish, snails, spiders and insects.

Idaho Dunes Tiger Beetle

The Idaho Dunes tiger beetle is currently a BLM Sensitive species in Idaho. It is found in the sand dune complexes in southwestern Fremont County. Additional populations occur near American Falls Reservoir, Idaho Falls, Bruneau Sand Dunes State Park, a sandy area 7 miles southeast of the Park, and some broadly scattered, weakly stabilized sandy areas in south central Idaho. The beetles are somewhat restricted to the open sands and the interface between the grass and sand.

St. Anthony Evening Primrose

St. Anthony evening primrose is a globally rare species that occurs only on the sand dunes of Fremont County near St. Anthony, Idaho. It co-occurs with the Idaho Dunes tiger beetle at this location. It is rhizomatous perennial plant species with large, white, four-petaled flowers. St. Anthony evening primrose is pollinated by night flying moths that would be inactive during the actual treatment times. Seed dispersal is most likely by gravity and wind.

Redband Trout

The Inland Columbia Basin redband trout is currently a BLM sensitive species. King Hill Creek, contains the eastern-most population of redband trout on record. Redband trout are found in tributary streams of the Snake River, Jarbidge River, Bruneau River, and Owyhee River. They differ from other closely related rainbow trout species by being able to tolerate and survive warmer water temperatures than related strains of trout. Like other trout the Redband commonly eats insects and spiders which fall in the water. Grasshoppers are a common food item.

Idaho Pointheaded Grasshopper

This grasshopper is a sensitive species for the BLM in Idaho. It has been reported in the Birch Creek drainage in the northwestern portion of the District and is described in Otte (1981). Current population levels of this grasshopper are unknown but APHIS personnel have collected specimens in the recent past.

Other Sensitive and Non-status Wildlife Species

Upland Game Birds and the Swainson's Hawk

Pheasant, quail, and Hungarian partridge chicks eat predominantly arthropods as they forage with adults. Grasshoppers provide a high protein food in the diet of these young birds. These upland birds can be found in the shrub steppe, weed waste areas and on farm crop land. The Swainson's hawk can be found in woodlands, riparian habitat with scattered trees, grasslands and sagebrush dominated shrub steppe. This species often nests near riparian zones, isolated juniper draws and where nest trees are available agricultural lands. The diet of this hawk includes small mammals, snakes, lizards and invertebrates. Concentrations of Swainson's hawks foraging on grasshoppers have been documented in Idaho (Atlas of Idaho's Wildlife, 1997).

Mourning Milkvetch, Picabo Milkvetch, Snake River Milkvetch, Janish's Penstemon, and Matted Cowpie Buckwheat

All three of these milkvetches are endemic to localized regions of southern Idaho adjacent to agricultural lands that were known to have been previously treated. Janish's penstemon and matted cowpie buckwheat, while somewhat more widely distributed, also occur adjacent to lands that have been treated in the past, primarily near the Snake River. Little is known of these species pollination biology, however, with the exception of the buckwheat, all probably rely on insect pollinators to some degree.

A large number of additional BLM sensitive plant species with varying degrees of rarity are present across southern Idaho. Whether they occur on lands or adjacent to lands that have been treated in the past is unknown.

Biological Soil Crusts

Biological soil crusts, also referred to as cryptogamic, microbiotic or microphytic soils crusts, consist of green algae, lichens, mosses, microfungi, cyanobacteria, and other bacteria. These communities are often well developed in arid and semi-arid lands throughout the world where the cover of vascular plants is often sparse or absent. They function as a living mulch by retaining soil moisture and reducing wind and water erosion. Some of these organisms fix atmospheric nitrogen and contribute to the soil organic matter. Below ground, lichen and moss rhizines, fungal hyphae, and cyanobacterial filaments form a matrix that binds soil surface particles together.

Grasshoppers and Mormon crickets have evolved with present-day native grasses, forbs, and sagebrush. These plants and many animal species are intimately associated and interdependent. Grasshoppers are an important food source to wildlife and are a significant part of healthy rangeland ecosystems. However, these benefits are negated when populations reach high densities and cause significant economic loss to crop production. Because of this agricultural loss, Congress has authorized APHIS to undertake a program of grasshopper control.

The vegetation type that has received the majority of the treatment in the past is the sagebrush/grass complex adjacent to private cropland. A general description of the affected environment may be found in each Field Offices respective Land Use Plan(s) and Environmental Impact Statement.

Areas of Critical Environmental Concern and Research Natural Areas

Through the planning process, the BLM has formally designated a number of special management areas across southern Idaho. These areas, known either as Areas of Critical Environmental Concern (ACECs) or Research Natural Areas (RNAs), are areas of public land where "the BLM has determined that special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes." Many of these areas were established to protect resources such as native plant communities in excellent condition or rare plant or animal populations.

ENVIRONMENTAL CONSEQUENCES

The proposed action described is this EA would cause environmental impacts. These impacts are presented in Chapter 4 and summarized in Tables 2-5 and 2-6 of APHIS FEIS 87-1. The proposed action would have no impact upon the following resources; climate, cultural, geology, topography, minerals, utilities, communication sites and energy use. No impacts have been identified which exceed those addressed in APHIS FEIS 87-1.

Potential environmental effects from the use of malathion and carbaryl are discussed in the 1987 APHIS EIS. Potential environmental effects from the use of diflubenzuron are discussed in the Chemical Risk Assessment : Diflubenzuron Use in the Grasshopper Cooperative Control Program. These three pesticides could be used by APHIS for grasshopper and Mormon cricket control in accordance with label instructions and restrictions.

The following table shows which resource elements are affected.

Element	Present Not Affected	Present Affected	Not Present
Air Quality	X		
ACEC's	X		
Cultural Resources	X		
Environmental Justice	X		
Farmlands (prime or unique)			X
Floodplains	X		
Native American Religious Concerns	X		
Riparian/Wetlands	X		
T&E Animals	X		
T&E Fish	X		
T&E Plants	X		
Hazardous waste			X
Water Quality	X		
Wild and Scenic Rivers			X
Wilderness			X
Wilderness Study Areas		X	

Air

Air pollutants, for which maximum allowable emission levels and concentrations are enforced by State air control agencies, would be produced by fuel combustion in airplanes, vehicles, and machinery used in grasshopper control activities. The amounts of these pollutants should have a negligible temporary effect on air quality.

Increases in ozone concentrations from the volatilization of pesticides and carriers are also expected to be negligible. The chemicals approved for use have low vapor pressure and are essentially nonvolatile.

Soils

The half-life of malathion and carbaryl is 0.5 and 3 to 9 days in soil respectively. There would be no bio-accumulation or concentration of food chain levels of parent compounds and their metabolites. While some soil micro-organism populations decrease after chemical treatments, recovery would be rapid and no long-term significant changes in population density would likely be found. Positive effects on the soil would accrue by reducing vegetation lost to grasshoppers and Mormon crickets, thereby protecting soils and the watershed.

Diflubenzuron (Dimilin 2L) has been shown to bind readily with organic matter in soils and is relatively immobile in the environment. The persistence of diflubenzuron in soils depends a great deal on the presence of microorganisms. The half life of diflubenzuron under field conditions has been shown to be about 19 days. Decomposition rates of ground liter do not seem to be affected.

Vegetation

Carbaryl and malathion are non-toxic to most plants when applied at label rates. These chemicals act quickly to reduce grasshopper and Mormon cricket infestations; thus, damage to vegetation from their foraging would be minimized. With the proposed 500-foot buffer zone, no adverse effects to non-registered crops should occur.

Carbaryl and malathion are highly toxic to bees that are pollinators of important crops. Operational procedures have been developed to protect domestic bees (see Table 2-1 of APHIS FEIS 87-1), but wild pollinators may be killed. Beekeepers are advised to remove honey bee colonies from the treatment areas, and typically, they are moved back into the area a few days following treatment.

Diflubenzuron does not directly affect vegetation, even though it may remain on leaf surfaces for several weeks following application. Diflubenzuron does not affect bees.

Biological Soil Crusts

No known studies have directly addressed the effects of oil, oil dispersants, or insecticides on species composition of biological soil crusts. However, some work has been done on individual cyanobacteria, green algae, and mosses isolated from soil crusts. These experiments have shown that crustal species are differentially affected, depending on the compound and the species tested. Thus, exposure to these agents could potentially alter species composition of crusts (Metting 1981).

Dimilin 2L is known to affect the formation and deposition of chitin, a polysaccharide, in the grasshopper's exoskeleton. Chitin is contained in the exoskeleton of other insects, all members of the phylum Arthropoda, as well as some fungi. Therefore, Dimilin 2L has the potential to not only affect grasshoppers and Mormon crickets, but non-target insects and components of the biological soil crust community as well. While chitinous algae (diatoms) are not adversely affected (Antia et al. 1985), we know of no studies that have been conducted in rangelands.

Wildlife

There is a possibility of indirect effects on local wildlife populations, particularly insectivorous birds that depend on a readily available supply of insects, including grasshoppers, for their own food supply and for their young. To the extent that grasshopper spraying may cause a severe reduction in target and non-target insects, it may adversely impact local populations of these wildlife species. Insects that prey on grasshoppers would also be affected.

Carbaryl and malathion have been shown to reduce brain cholinesterase (ChE) (an enzyme important to nerve cell transmissions) levels in birds. Effects of ChE inhibition are not fully understood but could impair the ability to gather food, escape predation, or care for young. Carbaryl is slightly to moderately toxic to birds and mammals (EXTOXNET, 1996).

There is some chance of adverse effects on bird reproduction through the use of any of these chemicals or diesel oil through direct toxicity to developing embryos in bird eggs.

In any given treatment season, only a small portion of the total rangeland in a region (as discussed beginning on page 3-18 of APHIS FEIS 87-1) is likely to be sprayed for grasshopper control. In low cyclic years there will be little or no treatment. Never the less, during high infestation years possible requested treatment areas would be closely examined to determine what areas would be treated if infestations occur.

Diflubenzuron (Dimilin 2L). Dimilin inhibits chitin, which is a substance contained in the exoskeleton of insects and all members of the phylum Arthropoda. Therefore, Dimilin has the potential to not only affect grasshoppers and Mormon crickets, but nontarget insects as well.

The toxicity of Dimilin to terrestrial arthropods varies, but most laboratory studies show adverse effects only at relatively high exposure levels. Among the more susceptible arthropods in laboratory studies are beetle larvae, lepidopteran caterpillars, and fly larvae. Honeybees, parasitic wasps, and predatory insects exhibit greater tolerance to Dimilin. Laboratory studies found the toxicity of Dimilin to aquatic organisms to vary by taxa (APHIS 1995). Dimilin is highly toxic to aquatic insects and crustaceans (such as crayfish) but does not generally affect fish, snails, and bivalves (APHIS 1995).

Field studies have also demonstrated the variable effect Dimilin can have on insects. Rangeland field tests (Catangui et al. unpublished) found that Dimilin did not substantially reduce soil surface-associated arthropods (ants, spiders, predatory beetles, and scavenger beetles) or flying arthropods (pollinator bees, predators, or parasites). In gypsy moth projects, Dimilin reduced nontarget moth and butterfly populations (APHIS, 1995). Birds and other wildlife are not affected by direct exposure to Dimilin, but some insectivorous species may show subtle changes in diet. Aquatic crustaceans and insects have also been shown to be adversely affected by Dimilin applications (APHIS, 1995)

The effects of Dimilin on nontarget organisms can be reduced by limiting the application to no more than 1.0 fluid ounce per acre per year. At this application rate populations of nontarget arthropods are likely to be only temporarily reduced and recovery to pretreatment levels can be expected. In addition, restricting the use of Dimilin to no closer than 500 feet of water bodies that contain aquatic insects and crustaceans will reduce the chance that those sensitive organisms will be exposed and adversely affected. A detailed discussion of "nontarget species hazard identification and exposure assessment" and non-target species risk characterization can be found in APHIS's Chemical Risk Assessment for Diflubenzuron Use in Grasshopper Cooperative Control Program.

Applying insecticides in block treatments, greater than ½ mile wide, would likely impact wildlife populations over the areas treated. The degree of effect would depend upon several variables including which insecticide was used, timing of the treatment relative to the life cycles of the insects, animals and birds present, and weather. If non-selective insecticides are used, many insect species, including those which prey on grasshoppers, could be killed. Bird and mammal species which prey on the insects could also be impacted by consuming insects containing insecticide and by losing their prey base. Some wildlife species are mobile enough that they can move to find more insects, but some are not. Eliminating nearly all insects over large areas will affect the entire food chain for wildlife in those areas.

The following tables show Non-Target Species and Species Groups; Species Status; Toxicity Levels for Malathion, Carbaryl, and Dimilin 2L (Direct Effects); Indirect Effects; Protective and Mitigation Measures; and Determination and Rationale. A key to explain the coding of the tables follows the tables. Table 1 is for Wildlife Species and Table 2 is for Plant Species. The Toxicity Information and References follow the Table Key.

Table 1. General direct and indirect effects of proposed pesticides, recommended protective and mitigation measures, and resulting determinations for non-target animal species.

Non-Target Species and Species Groups	Special Status Species	Toxicity Levels (Direct Effects)			Indirect Effects	Protective and Mitigation Measures	Determination and rationale
		Malathion	Carbaryl	Dimilin			
Terrestrial Invertebrates							
Chitin-producing invertebrates: butterflies, moths, ladybugs		Very high	Very high	Very high, larval stages only	2, 3	a, b, c	
Non-chitin producing invertebrates: ants, bees		Very high	Very high	Low	2, 3	a, b, c	
Soil invertebrates		High	Very high	Low	2, 3	a,c	
Point-headed Grasshopper,	S	Very high	Very high	Very high, larval stages only	2, 3	d	NE (1)
Idaho Dunes Tiger Beetle	S	Very high	Very high	Very high, larval stages only	2, 3	e	NLAA (2)
Aquatic Invertebrates							
Crustaceans		Very high	Very high	Very high	2, 3	f, h	

Non-Target Species and Species Groups	Special Status Species	Toxicity Levels (Direct Effects)			Indirect Effects	Protective and Mitigation Measures	Determination and rationale
		Malathion	Carbaryl	Dimilin			
Molluscs/snails		Very high	Very high	None - Slight	2, 3	f [1], g	
Banbury Springs limpet	E						NLAA (2)
Bliss Rapids snail	T						
Idaho springsnail	E						
Snake River physa snail	E						
Utah valvata snail	E						
Bruneau hot springsnail	E						
Aquatic Insects		Very high	Very high	Slight - Very high	2, 3	f, h	
Fish							
Fish, in general		Moderate - High	Very high	Slight	1, 3, 4	f, h	
Bonneville Cutthroat Trout	S (SR)						
Yellowstone Cutthroat Trout	S (SR)						
Redband Trout	S (SR)						
Shoshone Sculpin	S						NLAA (2)
Wood River Sculpin	S						
Bear Lake Sculpin	S						
Bear Lake Whitefish	S						
Bonneville Cisco	S						
Bonneville Whitefish	S						
Leatherside Chub	S						
Bull Trout	T	Moderate - High	Very high	Slight	1, 3, 4	d	NE (1)
Amphibians							

Non-Target Species and Species Groups	Special Status Species	Toxicity Levels (Direct Effects)			Indirect Effects	Protective and Mitigation Measures	Determination and rationale
		Malathion	Carbaryl	Dimilin			
Amphibians, in general		Very High (aquatic stages)	Moderate - high	Moderate - high	1, 2, 3, 4	f, h	
Spotted Frog	C						NLAA (1, 2)
Northern Leopard Frog	S						
Western Toad	S						
Woodhouse's Toad	S						
Reptiles							
Reptiles, in general		Low - moderate	Low - moderate	Low - moderate	1, 2, 3		
Longnose Snake	S						
Short-horned Lizard	S					a, f, h	NLAA (2)
Mojave Black-collared Lizard	S						
Common Garter Snake	S						
Western Ground Snake	S						
Mammals							
Small Mammals, in general		Moderate - High	Moderate	Low	1,2,3	a, h, i	
Northern Idaho Ground Squirrel	P					d	NE (1)
Southern Idaho Ground Squirrel	S					j	NLAA (2)
Rock Squirrel	S					d	NE (1)
Dark Kangaroo Mouse	S					d	NE (1)
Pygmy Rabbit	S					a, h, i	NLAA (3)

Non-Target Species and Species Groups	Special Status Species	Toxicity Levels (Direct Effects)			Indirect Effects	Protective and Mitigation Measures	Determination and rationale
		Malathion	Carbaryl	Dimilin			
Bats, in general		Moderate - High	Moderate	Low	1,3	a, k, f, h	NLAA (1, 2)
Western Small-footed Myotis	S						
Yuma Myotis	S						
Long-eared Myotis	S						
Townsend's Big-eared Bat	S						
Long-legged Myotis	S						
Western Pipistrelle	S						
Spotted Bat	S						
Fringed Myotis	S						
Large mammals, in general		Moderate - High	Moderate	Low			
Gray Wolf	X					d	NE
Grizzly Bear	T					d	NE
Canada Lynx	T					d	NE
Kit Fox	S				3	a, h, i	NLAA (1)
Birds							
Riparian/Wetland Birds, in general		Moderate - High	Low - Moderate	Low	1, 2, 3, 4	a, f, h	
Mountain Quail	S(P)						
Trumpeter Swan	S						NLAA (2, 3)
White-faced Ibis	S						
Yellow-billed Cuckoo	S						

Non-Target Species and Species Groups	Special Status Species	Toxicity Levels (Direct Effects)			Indirect Effects	Protective and Mitigation Measures	Determination and rationale
		Malathion	Carbaryl	Dimilin			
Shrub-steppe Birds, in general		Moderate - High	Low - Moderate	Low	1, 2, 3, 4	a, h, m, n	
Sage Grouse	S					h, m, n	
Sharp-tailed Grouse	S(SR)					h, m, n	NLAA (2, 3)
Sage Thrasher	S					h, m, n	
Brewer's Sparrow	S					h, m, n	
Sage Sparrow	S					h, m, n	
Loggerhead Shrike	S					h, m, n	
Ferruginous Hawk	S					h, m, n, p	
Grassland Birds, in general		Moderate - High	Low - Moderate	Low	1, 2, 3, 4	a, h, o	
Burrowing Owl	S					h, o, p	NLAA (2, 3)
Long-billed Curlew	S					h, o, p	NLAA (2, 3)
Bald Eagle	E	Moderate - High	Low - Moderate	Low		l, f, h	NLAA (1, 2)
Peregrine Falcon	DE	Moderate - High	Low - Moderate	Low		l, f, h	NLAA (1, 2)
Whooping Crane	X	Moderate - High	Low - Moderate	Low		d	NE (1)

[1] Consistent with but more restrictive than the Biological Opinion issued by the FWS on October 3, 1995.

Table 2. General direct and indirect effects of proposed pesticides, recommended protective and mitigation measures, and resulting determinations for non-target plant species.

Non-Target Species and Species Groups	Special Status Species	Toxicity Levels (Direct Effects) to pollinators			Indirect Effects	Protective and Mitigation Measures	Determination and Rationale
		Malathion	Carbaryl	Dimilin			
Native Plants (in general)	-----	Very high	Very high	Moderate	5, 6, 7	a, c, f, h, m, n	--------
Ute ladies'-tresses (*Spiranthes diluvialis)*	T	Very high	Very high	Moderate	5	f, h, q	NLAA (1,2)
Slickspot peppergrass (*Lepidium papilliferum)*	S (SR)	Very high	Very high	Low	5, 6	r, s	NLAA (1,2)
Mulford's milkvetch (*Astragalus mulfordiae)*	S (SR)	Very high	Very high	Low	5, 6	t	NLAA (1,2)
Woven-spore lichen (*Texosporium sancti-jacobi)*	S	-	-	High	7	j	NLAA (1,2)
Malheur prince's-plume (*Stanleya confertiflora)*	S (SR)	Very high	Very high	Low	5, 6	t	NLAA (1,2)
St. Anthony evening-primrose (*Oenothera psammophila)*	S	Very high	Very high	Low	5	j	NLAA (1,2)

Non-Target Species and Species Groups	Special Status Species	Toxicity Levels (Direct Effects) to pollinators			Indirect Effects	Protective and Mitigation Measures	Determination and Rationale
		Malathion	Carbaryl	Dimilin			
Mourning milkvetch (*Astragalus atratus v. inseptus)*	S	Very high	Very high	Low	5, 6	j	NLAA (1,2)
Picabo milkvetch (*Astragalus. oniciformis)*	S						
Snake River milkvetch (*Astragalus purshii v. ophiogenes)*	S	"	"	"	"	"	
Janish's penstemon (*Penstemon janishiae)*	S						
Matted cowpie buckwheat (*Eriogonum shockleyi*)	S						

Table Key

Special Status Species

E Listed Endangered under the Endangered Species Act (ESA)
T Listed Threatened under the ESA
P Proposed for listing under the ESA
X Experimental, Non-essential Population
DE Delisted
C Candidate Species for possible listing under the ESA
S BLM Sensitive and FWS Species of Concern
S(P) BLM Sensitive or FWS Species of Concern that has been petitioned for possible listing under the ESA
S(SR) BLM Sensitive or FWS Species of Concern that is currently under status review for possible listing under the ESA

Indirect Effects

1. General loss of prey.
2. Limited mobility to move out of treated area.
3. Ingestion of chemicals from vegetation and insects could affect survival or reproductive fitness.
4. Direct pesticide application on young of year could adversely affect survival and population recruitment.
5. Loss of important pollinators.
6. Loss of seed dispersal agents.
7. Dimilin may affect chitin formation in fungi.

Protective and Mitigation Measures for BLM-administered Public Lands

General Stipulation: The Control Records and Project Approval Forms will be compiled at the end of the season for the Level 1 Streamlining Team Review for compliance.

a. Limit application area as much as possible due to direct and indirect toxicity for beneficial species associated with this species group (see protective/mitigation measures of other species).

b. Use carbaryl bait since it would be less effective on non-target insects (e.g., flying insects, insects on shrubs and/or insects not attracted to bait).

c. Avoid using malathion or carbaryl spray due to toxicity risks for non-target beneficial species.

d. Proposed action will avoid known or historic species habitat area.

e. No aerial spray applications within 1 mile of habitat and no carbaryl bait within 1/4-mile of Idaho dunes tiger beetle habitat (pers. comm.., Dr. Charles Baker, Boise State Univ. Biology Dept.)

f. No aerial application of dimilin, carbaryl, or malathion within ½ mile or carbaryl bait within 500 feet of **all** water bodies including, but not limited to, streams (perennial and intermittent), springs, ponds, lakes, ditches, or canals.

g. Only use dimilin as aerial spray insecticide near (greater than ½ mile from) threatened or endangered snail habitats to further reduce risks (see measures under f.).

h. Lower risks by using dimilin rather than malathion or carbaryl spray.

i. Limit use of carbaryl bait.

j. Avoid using any pesticide within 1 mile of known and potential habitats.

k. Avoid using any pesticides within 2 miles of hibernacula, maternity, and other significant roost sites.

l. Refer to restrictions in the Fish and Wildlife Service's1995 Biological Opinion (10/3/95) for bald eagles and peregrine falcons.

m. Within shrub steppe habitats (shrub canopy cover greater than 5%), allow one application of dimilin using RAATs not farther than ½ mile from crop edge.

n. Within shrub-steppe habitats, allow use of carbaryl bait, if sage grouse and sharptail grouse are not present, using RAATs not farther than ½ mile from crop edge.

o. Within annual grasslands, allow use of dimilin and carbaryl bait using RAATs up to 1 mile from crop edge assuming other restrictions are met. For severe infestations carbaryl spray can be used on a case-by-case basis up to 1 mile from crop edge, also subject to other specific restrictions, such as presence or absence of grouse species.

p. Avoid using pesticides within one mile of known nest sites.

q. Avoid aerial spray application of pesticides within 3 miles of known populations. Carbaryl bait can be used within 3-mile buffer but only up to 500 feet from water (see f. and FWS Biological Opinion (10/3/95) for *Spiranthes* spp.

r. Avoid aerial spray application of pesticides within 3 miles of known populations. Carbaryl bait can be used within 3-mile buffer but only up to ½ mile of known population.

s. No aerial spraying or bait in potential habitat areas unless field surveyed. If species found , see protective measures under r.

t. Avoid aerial spray application of pesticides within 3 miles of known populations. Carbaryl bait can be used within 3-mile buffer but only up to 500 feet of known populations.

Determinations

NE No Effect
NLAA Not Likely to Adversely Affect

Rationale for Determinations

1. Avoiding known and potential habitats.
2. Buffer around known and potential habitats.
3. Adverse effects highly unlikely as a result of proposed chemical and application method.
4. More restrictive than 1995 Biological Opinion protective measures.

Toxicity Information

Malathion

Terrestrial Insects

- Broad spectrum insecticide. Highly toxic to bees. (1) (2)
- Crustaceans - medium to very high toxicity (2)
- Earthworms - high toxicity (2)

Aquatic Invertebrates

- Extremely toxic for various aquatic invertebrates. (1)
- Aquatic worms - moderate toxicity (2)
- Aquatic insects - very high toxicity (2)
- Crustaceans - medium to very high toxicity (2)

Fish

- Very high toxicity for walleye, high toxicity for brown and cutthroat trout, moderate toxicity for fathead minnow, slight toxicity for goldfish (1)
- Medium to high toxicity (2)
- High toxicity to trout (9)

Amphibians

- Highly toxic to aquatic stages of amphibians (1)
- Very high toxicity (2)
- After 10 applications of malathion, adult and juvenile plethodontid salamanders displayed no ChE inhibition, decreases in abundance or effects on lipid storage. (10)

Birds

- Moderately toxic to birds although LD50 values for pheasants, starlings and blackbirds were in the highly toxic range. (1)
- Medium to high toxicity (2)
- High toxicity (9)
- Has been shown to significantly affect sharp-tailed grouse behavior (5)

Mammals

- Oral: medium to high toxicity; Dermal: medium to high toxicity; Inhalation: medium toxicity (1) (2)
- Moderate High (low end of high) toxicity (9)

Plants and Beneficial Pollinators

- Nectar of treated plants toxic to bees (2)

Carbaryl

Terrestrial Insects

- Bees - extremely toxic (2)
- Crustaceans - very high toxicity (2)
- Earthworms - extremely toxic (2)
-

Aquatic Invertebrates

- Aquatic worms - high to very high toxicity (2)
- Aquatic insects - very high toxicity (2)
- Small amounts of carbaryl can substantially reduce the numbers of aquatic insects (12).
- Studies indicate that after direct exposure of streams to carbaryl spraying it can take from several months to years for aquatic insect community to return to pre-treatment conditions (12).

Fish

- Very high immediate toxicity (2)(9)(12).
- May affect reproduction, increased vulnerability to predation, swimming capabilities (2)
- At low levels of carbaryl, indirect effects are more serious than acute toxicity: 1.25 lbs. Of carbaryl per acre was not directly toxic to fish but food items were reduced by 97.2% (12)

Birds

- Low to medium immediate toxicity (2)
- May affect breeding success (2)
- Contaminated dead or struggling arthropods have proved attractive and sometimes lethal to wild birds that opportunistically increased their consumption after aerial application of carbaryl. (4)
- No significant effects of carbaryl spray on the number of breeding bird pairs, bird abundance, nest success mortality rates, or activities of brain cholinesterase in the breeding population were detected in a study in Montana forests. Spray exposure due to forest canopy cover may have been a mitigating factor in the study (4).

- No sick or dead birds were observed or any abnormal behavior in birds on plots treated with Sevin-4-Oil (2.24 kg/ha applied June 27) (6).
- A 55% decrease in bird populations were detected following two applications of carbaryl spray at 1.12 kg/ha on a 2000-ha spray block of deciduous forest. (7)
- Slightly toxic (8)
- Spraying carbaryl has been found to significantly inhibit ACHE activity in only a few species, primarily canopy dwellers (12). [most studies done in forest ecosystems - what about shrub steppe where there isn't any canopy protection?]
- Oil-based spray application of carbaryl may have adverse effect on eggs (12).
- A study in Wyoming noted a 78% decrease in bird population after spray with Sevin with smaller birds disappearing first. Seed eater, such as mourning doves, did not appear affected. Carbaryl was sprayed at 8 oz. /acre. (13).
- Carbaryl spraying applied during the nesting season of birds would likely result in abandonment of the adult birds and heavy loss of nestlings (12).
- Carbaryl is known to have limited bird repellent properties and carbaryl bait may be less attractive to birds than contaminated insects (12).

Mammals

- Moderately toxic - LD50= 540 (9)
- Ord's kangaroo rats and white-footed mice had 20% and 97% mortality when carbaryl bait had 2% and 20% active ingredient by weight, respectively. However, tests also indicate that these rodents preferred natural forage over treated and untreated bait. (11)
- Low to moderate toxicity and no significant effects of reproduction (12)

Plants and Beneficial Pollinators

- Toxic to some plants, chromosome damage in some (2)
- Low phytotoxicology (12)
- Carbaryl can persist and accumulate in the aquatic environment. The bio-accumulation ratios for algae and duckweek are fairly high (12).

Dimilin

Terrestrial Insects

- Crustaceans -very high immediate toxicity, may affect reproduction (2)
- Nontoxic to bees (3)

Aquatic Invertebrates

- Crustaceans -very high immediate toxicity, may affect reproduction (2)
- Nontoxic to aquatic organisms (3)
- Arthropods susceptible in the pre-molting stage (3)

Fish

- Low immediate toxicity (2)
- Nontoxic to fish (3)

Birds

- Low immediate toxicity (2)
- May affect testosterone levels at moderate amount of the chemical (3)
- No sick or dead birds were observed or any abnormal behavior in birds on plots treated with dimilin (.28 kg/ha applied June 26) (6).

Mammals

- Low immediate toxicity for oral, dermal, or inhalation (2)

Plants and Beneficial Pollinators

- Little is absorbed, metabolized or translocated in plants (3)

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Social and Economic

A description of socioeconomic impacts are discussed beginning on page 4-80 of APHIS FEIS 87-1. Site-specific conclusions would be essentially the same.

BLM and APHIS' involvement in grasshopper control is initiated by adjoining land owners complaints and requests for control to mitigate their agricultural crop damage that occurs from foraging grasshoppers and Mormon crickets. Crop damage is determined by the extent of infestations and the value of the product being produced.

Idaho expects significant grasshopper/Mormon cricket infestations this year. In Southern Idaho there are approximately 4,300 linear miles of public land that interface with private land. Agricultural use (if in use) on these bordering lands is unknown at this time. Attachment 4 reflects the number of miles of BLM / private land interface by county in Southern Idaho. In 1999, 400 linear miles of crop protection were done. The crops grown included potatoes, wheat, sugar beets, and alfalfa. The value of these crops was

estimated at $48 million dollars. If left untreated, grasshoppers/Mormon crickets would threaten a significant portion of these crops. Actual losses estimated by APHIS could be as high as 8 million dollars in 2000. If additional areas of crops are threatened this year, the potential for higher economic loss would occur.

Tribal Consultation

Prior to treatment for grasshoppers affected tribes would be consulted on potential locations of such treatments. Tribal representatives would have the opportunity to identify native plant use areas which might be impacted by the treatment program. Consultation would allow for mitigation of key tribal plant collection areas.

Human Health

APHIS FEIS 87-1 contains a detailed chemical hazard analysis for each insecticide (excluding Dimilin 2L) proposed for use in the Upper Snake River District. Impacts to workers and the general public were analyzed for all possible routes of exposure (dermal, oral and inhalation) under a range of conditions designed to over-estimate risk. The operational procedures and spraying conditions examined in those analyses conform with those expected for operations in southern Idaho BLM.

The Material Safety Data Sheet for Dimilin 2L indicates the following specific hazards, "contact with eyes or skin may cause irritation. Prolonged excessive exposure may cause methemoglobinemia. The very low acute toxicity suggests that this is not a significant adverse effect. There are no known medical conditions that are aggravated by exposure to this material."

No human health effects are likely from exposure to Dimilin 2L (diflubenzuron) if it is used according to label instructions. A Human Exposure Assessment was done in detail for diflubenzuron and can be found in APHIS's "Chemical Risk Assessment for Diflubenzuron Use in Grasshopper Cooperative Control Program".

Consistent with Executive Order No. 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," consideration has been made to the potential for disproportionately high and adverse human health or environmental effects on any minority populations and low-income populations. The environmental and human health effects from the proposed treatment is minimal and is not expected to have disproportionate adverse effects to any minority or low income populations.

Consistent with Executive Order No. 13045, "Protection of Children From Environmental Health Risks and Safety Risks," BLM has considered the potential for disproportionately high and adverse environmental health and safety risks to children. The proposed treatment is to rangeland where the presence of children is not expected. The public is not normally in or around areas being treated, so

pesticide exposure should not occur. Possible exposure could occur from children playing on the Federally owned rangeland. This accidental exposure scenario is highly improbable and determined to have no adverse human health effects. Therefore, no disproportionate effects on children are anticipated as a consequence of implementing the proposed treatment program.

APHIS operational procedures found in the EIS and APHIS *Grasshopper Program Manual* are designed to mitigate or avoid any action that might have significant adverse impacts on the human environment.

Wilderness/ACECs

The grasshopper and Mormon cricket control program would have an insignificant impact on the nature or use of these areas. BLM policy allows some control of insect outbreaks as related in Washington Office Instruction Memorandum No. 87-408 as follows:

> "Insect and disease control by chemical or biological means may be permitted if applied to individual trees or areas up to 5 acres or to larger areas under emergency conditions when there is no effective alternative. Insect control by chemical or biological means may be applied to larger areas under non-emergency conditions when there are insects present in an unusually high population in a peak year of their population cycle and the infestation, if uncontrolled, would cause serious damage to crops or property on adjacent non-Federal lands."

The public lands that are in Wilderness areas or ACECs are not highly susceptible to outbreaks of grasshoppers or crickets and the need to spray these areas is low.

Cumulative Impacts

Rangeland areas adjacent to crops may be retreated with Dimilin, carbaryl, or malathion to protect growing crops from migrating grasshoppers or Mormon crickets. These re-treatments may occur at 4-week intervals. A discussion of re-treatments is found in the 1987 EIS. The analysis of the data presented in the Chemical Risk Assessment: Diflubenzuron Use in the Grasshopper Cooperative Control Program indicates that a similar interval would be appropriate for diflubenzuron applications. Areas treated in multiple years are impacted to a higher degree than those not treated every year. This has the effect of greatly reducing the food source for birds and may impact small mammal populations. Also multiple (more than one treatment in the same year) control treatments on an area will have higher impacts on wildlife populations. For example some songbirds try to produce multiple clutches the same year. Multiple spraying in the same year could impact young from each clutch. Treatment and re-treatment of the same area within a year will impact the reproductive success (number of young fledged) locally. Periodic treatments may have a longer term impact on some native plants because of loss of native pollinators. Choice of the pesticide used and type of application will influence over all impacts.

Use of pesticides by Field Office Managers for other pest control operations (noxious weed control for example) in areas adjacent or nearby areas receiving crop protection treatments may also result in cumulative impacts. Any such areas should be identified and specifically monitored for indications of cumulative impacts.

Any chemical applied to control grasshoppers and Mormon crickets has the potential to cause adverse impacts to noxious weed bio-control agents that have been established by BLM and their cooperators working to prevent the further establishment of noxious weeds. Attempts should be made with any control to identify site specific bio-control colonies so that the effects of chemical application can be mitigated

Cumulative impacts are not expected to significantly effect the environment in the areas receiving crop protection treatments. Residues of the program pesticides are not expected to persist in the environment from year to year. Localized temporary accumulation of pesticides in the environment may occur in transition areas between the rangeland and the adjacent crops because of program pesticide applications made to the crops by private individuals. However, these localized effects should not pose a threat to the environment.

Synergistic effects occur when the combined effects of two or more chemicals are greater than the effects of the individual chemicals. There is a possibility that synergistic effects could occur from program insecticides interacting with chemicals already in the environment from other Federal or private pest control operations. Diflubenzuron is reported to be synergistic with the defoliant DEF (NLM), 1988), a defoliant that is applied at the end of the cotton season. DEF is not likely to be used on Idaho rangelands. Although synergistic effects are not expected to occur, APHIS and BLM should attempt to identify any such areas to determine if additional monitoring may be necessary.

AGENCIES AND INDIVIDUALS CONSULTED

The BLM Districts and their Field Offices coordinate and interact with other Tribes, Federal, State, County and local agencies on a continuing basis concerning grasshopper and Mormon cricket control activities. Pages 5-1 through 5-9 of APHIS FEIS 87-1 contain an overview of this interaction. The following agencies/individuals were consulted in the preparing this EA:

Idaho Department of Fish and Game

BLM Field Office Staffs: Idaho Falls Field Office, Pocatello Field Office, Burley Field Office, Shoshone Field Office, Cascade Field Office, Owyhee Field Office, Bruneau Field Office, Jarbidge Field Office.

Department of Agriculture, Rob McChesney, Dave McNeill, APHIS (PPQ), Boise

U. S. Fish and Wildlife Service, Boise Field Office, Marilyn Hemker, Rich Howard, and Susan Burch.

The following agencies / individuals were notified in the preparation of this EA:

See attached NEPA LOG mailing list, Attachment 2.

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USRD Land Use Plans for the Burley, Shoshone, Idaho Fall, and Pocatello Field Offices.

Table 2-1 -- Operational procedures Attachment 1

ALL METHODS

1. Follow all applicable Federal, State, and local environmental laws and regulations in conducting grasshopper control operations.

2. Identify treatment areas in accordance with the APHIS Grasshopper Program Manual.

3. Hold public meetings well in advance of proposed programs. Arrange for public announcements to encourage public input into the decision making process.

4. Notify Federal and State land managers and private cooperators of grasshopper infestations on their lands. This notification will describe estimated boundaries, severity of infestation, and optimal time frames for treatment. The notification will advise the land manager to advise APHIS of any sensitive areas (parks, recreation areas, and the like) that may exist in proposed treatment areas.

5. Obtain in writing land managers' and owners' requests that control be undertaken on their lands. When these requests originate as telephone calls, ensure that a followup letter is received before the expenditure of APHIS funds.

6. Except when treatments are mandatory under State law, avoid residences whose occupants object to their property being treated. When occupants object but State law requires treatment, APHIS will cooperate to the extent authorized by Federal and State law.

7. Endangered Species (see also the operational procedures listed under each control method).

   a. Formal and informal consultation with the U.S. Fish and Wildlife Service will be accomplished at the national level or designated contact points. (The Denver Regional Office has been designated as the official contact for formal consultation.) Communications with the Fish and Wildlife Service at the local level will be restricted to acquiring biological and distributional data for specific sites.

   b. APHIS has prepared a Biological Assessment on Federal endangered and threatened species for all States involved in its program. The Biological Assessment will be reviewed and updated as necessary on an annual basis. The measures designed to protect endangered and threatened species are contained in the Biological Assessment prepared by (and available from) APHIS and the Biological Opinion prepared by (and available from) the Fish and Wildlife Service.

   c. To protect peregrine falcon or bald eagle nesting sites, do not conduct any operations within 1 mile of those sites, and follow other protective measures agreed upon and documented through the conference and/or consultation process for proposed or listed species.

   d. State-listed endangered and threatened species, Federal candidate species, and other sensitive areas will be addressed in site-specific environment assessments.

8. Instruct all program personnel on the use of equipment, materials, and procedures; supervise to ensure procedures are followed properly.

AERIAL BROADCAST APPLICATIONS (CHEMICAL AND BIOLOGICAL METHODS)

1. Strictly follow all EPA- and State-approved label instruction for chemical and biological insecticides.

2. Aircraft, dispersal equipment, and pilots that do not meet all contract requirements will not be allowed to operate.

3. All USDA APHIS Plant Protection and Quarantine (PPQ) employees who plan, supervise, recommend, or perform pesticide treatments must be certified under the APHIS Certification Plan. They are also required to know and meet any additional qualifications or requirements of the States where they perform duties involving pesticide use.

Table 2-1 (continued)--Operational procedures

4. Notify residents in treatment areas or their designated representatives at least 5 days prior to proposed operations. Advise them of the control method to be used, the proposed method of application, and precautions to be taken (for example, advise parents to keep children and pets indoors during ULV treatment).

5. Post flags or other markers in areas without landmarks such as highways, country roads, railroads, fences, utility lines, rivers, ridges, brush patches, buildings, and the like. Use flags or markers for pilot guidance on project boundaries and whenever precise applications are required and electronic guidance is not available. Mark blocks that are to be omitted from, or included in, the treatment area so they are visible from the air.

6. Provide two-way radios for all field personnel. Radio communication will be available for continuous contact among all units involved in any program.

7. Stock safety kits, thermometers, flagging material, wind gauges, spray-deposit samplers, and daily aircraft records in advance and make them available to relevant personnel.

8. No treatments will occur over congested areas. For all flights over congested areas, the contractor must submit a plan to the appropriate FAA District Office and the plan must be approved by that office; a letter of authorization signed by city or town authorities must accompany each plan. Where possible, plan ferrying and turnaround routes to avoid flights over congested areas, bodies of water, and other areas that are not to be treated.

9. Drum Disposal. All insecticide drums must be triple-rinsed before disposal. Rinse solution from drums may be used as diluent in preparing spray tank mixes, or it may be collected and stored for subsequent disposal in accordance with label instructions. One of the following methods for disposal must be used (listed in order of preference):

   a. Require chemical companies, distributors, or suppliers to accept the empty triple-rinsed containers.

   b. Transfer the empty triple-rinsed containers to State cooperators.

   c. Crush and/or puncture the empty triple-rinsed containers, report on Form AD-112 to Property Services, Field Servicing Office, Minneapolis, MN, and dispose of as scrap metal.

10. Conduct mixing, loading, and unloading in an area where an accidental spill will not contaminate a stream or other body of water.

11. In the event of an accidental spill, follow the procedures set forth in PPQ Guidelines for Managing and Monitoring Pesticide Spills (USDA APHIS, 1981).

12. Conduct prespray reconnaissance flights to ensure that pilots are familiar with program area boundaries, buffer zones, and any other areas that are not to be treated.

13. Notify local police and fire officials of pesticide storage areas and treatment blocks.

Baits (Chemical and Biological Methods)

1. Do not use blowers for loading bran baits into the hopper. (Blowers can cause packing of baits.)

2. The bait hopper must be dust-tight. It must empty completely with uninterrupted flow, and it must be vented to avoid erratic flow of materials.

Table 2-1 (continued)--Operational procedures

3. There must be a dust-tight gate in the hopper throat to avoid leakage during ferry flights, when flying over sensitive areas, and during turnarounds. Linkage between the gate and its cockpit control handle must be snug. Gate stops are required to ensure that the hopper gate is opened to exactly the same position each time: screw-type stops are preferred; stops that are adjustable through a series of holes or notches are not acceptable. The gate stop must be at the gate and not in the cockpit on larger aircraft.

4. For light applications, flow restricters are required in the hopper throat to reduce the rate of flow of materials and sensitivity of the control gate adjustments.

5. Carbaryl Bait.

   a. Protective clothing will be worn by all pilots, loaders, and field personnel, as required by the label.

   b. Do not apply within 200 feet of reservoirs, lakes, ponds, pools left by seasonal streams, springs, wetlands, and perennial streams and rivers.

   c. Do not apply within 500 feet of any school or recreational facility.

   d. Do not apply where the water table is high, where leaching or surface runoff is likely, or when precipitation is imminent.

   e. Do not apply within 200 feet or directly to oats, barley, and rye (fall treatments) and observe minimum days between final application and harvest for all other crops.

   f. Do not apply within 200 feet of commercial bee hives.

Ultra-Low-Volume Aerial Application (Chemical Methods)

1. To minimize drift and volatilization, do not use ULV sprays when any of the following conditions exists in the spray area: wind velocity exceeds 10 miles per hour (unless lower wind speed required under State law); rain if falling or is imminent; weather is foggy; normally when temperatures exceed 80^0 F; air turbulence that could seriously affect the normal spray pattern; temperature inversions that could lead to offsite movement of spray.

2. Weather conditions on operation areas will be monitored by trained personnel before and during application. Operations will be suspended anytime it appears that weather conditions could jeopardize safe placement of the spray on target areas.

3. Do not apply when foliage is wet.

4. Do not apply chemical ULV any insecticide within 500 feet or directly to any crops for which it is not labeled, or to any crop for which not tolerance has been established, unless an exemption under Section 18 of FIFRA has been granted.

5. All APHIS project personnel will have baseline cholinesterase tests before the first application of insecticide and when deemed appropriate thereafter. It will be recommended that contract, State, and private project personnel also participate in a cholinesterase monitoring program.

6. Advise unprotected workers to stay out of treated areas until insecticides have dried.

7. Use nozzle types and sizes, spray system pressure, and nozzle orientation as specified in the APHIS aerial prospectus.

8. A vent for the insecticide tank, of sufficient size to permit unrestricted flow when a load is jettisoned, is mandatory.

Table 2-1 (continued)--Operational procedures

9. Do not spray while school buses are operating in the treatment area.

10. Protective long-sleeved work clothing will be worn by all pilots, loaders, and field personnel as specified in the label. For mixers and loaders of acephate, protective clothing must include impermeable gloves, long-sleeved shirt, and long-legged trousers.

11. Do not apply within 500 feet of reservoirs, lakes, ponds, pools left by seasonal streams, springs, wetlands, and perennial streams or rivers.

12. Do not apply where the water table is high or where leaching or surface runoff is likely.

13. Do not apply within 500 feet of any school or recreational facility.

14. Do not allow lactating dairy animals to feed or graze on grass hay that has been treated with acephate. Do not use spent mint hay that has been treated with acephate for dairy animal food.

15. Protection of Bees:

    a. If off-season or early-season planning indicates an area may require treatment, send early notification letters and maps to all registered apiarists in the State or near the area.

    b. Conduct prespray reconnaissance flights to ensure that all honey bees have been moved or protected. Should bees remain, ensure that the beekeeper received notice of the impending treatment or that programs are conducted in accordance with State law.

    c. If treatments are planned within 4 miles of areas where alkali or leaf cutter bees are being use (for increasing the yield of alfalfa seed), monitor wind conditions and other drift factors closely and do not apply ULV sprays when drift could reach these areas. In all such cases, use spray samplers (dye cards) near these areas.

    d. Do not apply acephate, carbaryl, or malathion to any blooming crops or weeds or allow it to drift onto blooming crops and weeds if commercial bees are visiting the area.

Table 2-2--Recommended mitigation measures

AERIAL BROADCAST APPLICATIONS (CHEMICAL AND BIOLOGICAL METHODS)

1. Provide local representatives of interested State and Federal wildlife agencies the opportunity to observe all segments of the program.

Ultra-Low-Volume Aerial Application (Chemical Methods)

1. When possible, apply sprays only during morning hours.

2. Application aircraft will fly at a median altitude 1 to 1.5 times the wingspan of the aircraft whenever possible.

3. Advise local law enforcement officials to divert traffic on major highways around spray blocks or to hold traffic on major highways until aircraft have completed treatments that could affect vehicles or travelers.

4. Protection of Bees:

   Prior to treatment, send a second notification by letter, personal contact, or public notification to all registered apiarists in or near the treatment area before treatment is to occur.

NEPA LOG MAILING LIST

Attachment 2

COMMITTEE FOR IDAHO'S HIGH DESERT
P.O. BOX 2863
BOISE, ID 83701

BUREAU OF INDIAN AFFAIRS
FORT HALL INDIAN AGENCY
POB 220
FORT HALL, ID 83203

IDAHO DEPT OF FISH & GAME, REG 6
DON WRIGHT
1515 LINCOLN ROAD
IDAHO FALLS, ID 83401

IDAHO DEPT OF FISH & GAME, REG 5
DEXTER PITMAN
1345 BARTON ROAD
POCATELLO, ID 83204

THE NATURE CONSERVANCY
CINDY LUNTE
POB 165
SUN VALLEY, ID 83353

BLUE RIBBON COALITION
ADENA COOK
P.O. BOX 1427
IDAHO FALLS, ID 83404

BONNEVILLE CO BRD OF COMMISSIONERS
605 N. CAPITOL AVE.
IDAH0 FALLS, ID 83401

JEFFERSON CO BRD OF COMMISSIONERS
PO BOX 275
RIGBY, ID 83442

BUTTE CO BOARD OF COMMISSIONERS
COURTHOUSE
248 W. GRAND AVE.
ARCO, ID 83213

CLARK CO BOARD OF COMMISSIONERS
BOX 205
DUBOIS, ID 83423

BINGHAM CO BOARD OF COMMISSIONERS
501 NORTH MAPLE, #204
BLACKFOOT, ID 83221

TETON CO BOARD OF COMMISSIONERS
POB 756
DRIGGS, ID 83422

BANNOCK CO BOARD OF COMMISSIONERS
P.O. BOX 4016
POCATELLO, ID 83205

BEAR LAKE CO BRD OF COMMISSIONERS
PO BOX 190
PARIS, ID 83261

CARIBOU CO BOARD OF COMMISSIONERS
COURTHOUSE
SODA SPRINGS, ID 83276

CUSTER CO BOARD OF COMMISSIONERS
COURTHOUSE
CHALLIS, ID 83226

FRANKLIN CO BRD OF COMMISSIONERS
39 WEST ONEIDA
PRESTON, ID 83263

FREMONT CO BOARD OF COMMISSIONERS
151 W 1ST N
ST. ANTHONY, ID 83445

MADISON CO BOARD OF COMMISSIONERS
P.O. BOX 389
REXBURG, ID 83440

POWER CO BOARD OF COMMISSIONERS
COURTHOUSE
AMERICAN FALLS, ID 83211

BLAINE CO BOARD OF COMMISSIONERS
P.O. BOX 400
HAILEY, ID 83333

IDAHO STATE JOURNAL
305 SOUTH ARTHUR AVENUE
P.O. BOX 431
POCATELLO, ID 83205

THE POST REGISTER
333 NORTHGATE MILE
IDAHO FALLS, ID 83401

U.S. HOUSE OF REPRESENTATIVES
HONORABLE MIKE
SIMPSON
304 NORTH 8TH ST, RM 325
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DIXIE OSWALD
335 1ST ST
IDAHO FALLS, ID 83401

CARIBOU NATIONAL FOREST
SUITE 294, FEDERAL BUILDING
250 SOUTH FOURTH AVE
POCATELLO, ID 83201

CHALLIS NATIONAL FOREST
HC 63, BOX 1671
CHALLIS, ID 83226

TARGHEE NATIONAL FOREST
P.O. BOX 208
420 NORTH BRIDGE ST
ST. ANTHONY, ID 83445

WASATCH-CACHE NATIONAL FOREST
8230 FEDERAL BLDG
125 SOUTH STATE ST
SALT LAKE CITY
UT 84138

IDAHO DEPT. OF FISH & GAME
TOM MAEDER
1165 E 1800 N
TERRETON, ID 83450

IDAHO ENVIRONMENTAL COUNCIL
JERRY JAYNE
1568 LOLA ST
IDAHO FALLS, ID 83402

THE WILDERNESS SOCIETY
413 WEST IDAHO ST, STE 102
BOISE, ID 83702

U.S. FISH & WILDLIFE SERVICE
4425 BURLEY DRIVE
SUITE A
CHUBBUCK, ID 83202

ENVIRONMENTAL PROTECTION AGENCY
1435 NORTH ORCHARD
BOISE, ID 83706

IDAHO DEPT OF WATER RESOURCES
EASTERN DISTRICT OFFICE
900 N SKYLINE DRIVE
IDAHO FALLS, ID 83402

IDAHO CONSERVATION LEAGUE
P.O. BOX 2671
KETCHUM, ID 83709

STATE HISTORIC PRESERVATION OFFICE
IDAHO HISTORICAL SOCIETY
210 MAIN ST
BOISE, ID 83702

IDAHO DEPT OF PARKS & RECREATION
STATE HOUSE MAIL
BOISE, ID 83720

SOIL CONSERVATION SERVICE
IDAHO FALLS FIELD OFFICE
1120 LINCOLN RD
IDAHO FALLS, ID 83401

ROCKY MTN OIL & GAS ASSN (RMOGA)
1900 GRANT STREET, STE 510

DENVER
CO
80203-4305

CURRIE LOCKETT
364 N 100 W
LOGAN
UT 84321

HIGH COUNTRY RC&D COUNCIL
STEVE SMART
263 EAST 4 NORTH
REXBURG, ID 83440

THE ECOLOGY CENTER
801 SHERWOOD SUITE B
MISSOULA, MT 59802

TROUT UNLIMITED
MATT WOODARD
1102 ATLANTIC ST
IDAHO FALLS, ID 83404

IDAHO DIV OF ENVIRONMENTAL QUALITY
JIM JOHNSTON
900 N SKYLINE DR
IDAHO FALLS, ID 83402

J. D. ARCHER
POB 58031
SALT LAKE CITY, UT 84158

GEORGE BROWN
MEAD, WA 99021

GREATER YELLOWSTONE COALITION
MARV HOYT
162 NORTH WOODRUFF
IDAHO FALLS, ID 83401

THE HENRY'S FORK FOUNDATION, INC.
MIKE HORTON
HC 66 BOX 102
ISLAND PARK, ID 83429

U.S. ARMY CORPS OF ENGINEERS
EXCHANGE PLAZA
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IDAHO FALLS, ID 83401

ALLIANCE FOR THE WILD ROCKIES
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BOX 8731
801 D SHERWOOD STREET
MISSOULA
MT 59802

KENT CHRISTOPHER
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TETON, ID 83451

SAVE OUR SNAKE, INC
DALAN ANDREWS
676 E 1550 N
SHELLEY, ID 83274

WATER RESOURCES DIVISION
U.S. GEOLOGICAL SURVEY
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SALT LAKE CITY, UT 84104

U.S. BUREAU OF RECLAMATION
PN REGIONAL OFFICE
1150 NORTH CURTIS ROAD
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DEPARTMENT OF ENERGY
MARK ARENAZ
IDAHO OPERATIONS OFFICE
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DOYLE MARKHAM, PhD
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VEGETATION MANAGEMENT
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5655 S 2400 W
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P.O. BOX 2922
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WEED MANAGEMENT SERVICES
CELESTINEDUNCAN
P.O. BOX 9055
HELENA, MT 59604

SOUTHEAST IDAHO REFUGE COMPLEX
U.S. FISH & WLDLF SERVICE
1246 YELLOWSTONE AVE
POCATELLO, ID 83201

CRATERS OF THE MOON NAT'L MONUMENT
ARCO, ID 83213

IDAHO TRANSPORTATION DEPARTMENT
5151 SOUTH 5TH
P.O. BOX 4700
POCATELLO, ID 83205

IDAHO TRANSPORTATION DEPARTMENT
206 NORTH YELLOWSTONE
P.O. BOX 97
RIGBY, ID
83442

SOUTH FORK COALITION
3075 TIPPERARY LANE
IDAHO FALLS, ID 83404

IDAHO OUTFITTERS & GUIDES BOARD
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BOISE, ID 83701

SNAKE RIVER CUTTHROAT CHAPTER
TROUT UNLIMITED
P.O. BOX 50363
IDAHO FALLS, ID 83402

EAST-CENTRAL IDAHO PLANNING
& DEVELOPMENT ASS'N, INC
310 NORTH 2ND EAST
REXBURG, ID 83440

BONNEVILLE POWER ADMIN
1350 LINDSAY DR
IDAHO FALLS, ID 83402

DISTRICT SEVEN HEALTH DEPARTMENT
254 E STREET
IDAHO FALLS, ID 83402

U.S. HOUSE OF REPRESENTATIVES
HONORABLE HELEN CHENOWETH
304 NORTH 8TH ST, RM 454
BOISE, ID 83702

COMMITTEE FOR IDAHO'S HIGH DESERT
SCOTT PLOGER

305 7TH STREET
IDAHO FALLS, ID 83401

SILVER CREEK CONSTRUCTION
ATTN: MELISA
246 N YELLOWSTONE
RIGBY, ID 83442

IDAHO WATERSHEDS PROJECT
JON MARVEL
BOX 1602
HAILEY, ID 83333

LARSON & ASSOCIATES, INC.
POB 1101
POCATELLO , ID 83204-1101

ACT ESTIMATING
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REXBURG, ID 83440

IDAHO WILDLIFE FEDERATION
NEIL WOOLEY
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PRESTON, ID 83263

IDAHO WILDLIFE FEDERATION
ALAN BRIDWELL
910 WESTWOOD DR
REXBURG, ID 83440

NW BAND OF THE SHOSHONI NATION
427 NORTH MAIN, SUITE 101
POCATELLO , ID 83204-3016

HAGENBARTH LIVESTOCK
JIM HAGENBARTH
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DILLON, MT 59725

BOB EINHAUS
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INTERMOUNTAIN POWER SOURCE
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BOB BERGENDORF
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LAVA HOT SPRS , ID 83246

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HUBERT E QUADE
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BOX 165 B
POCATELLO , ID 83202-9517

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THE SHOSHONE-BANNOCK TRIBES
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GEORGE NEDROW
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BLACKFOOT RIVER WATERSHED COUNCIL
CHARLOTTE REID

ROUTE 1 BOX 213
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A & R EXCAVATION CORPORATION
ANN WOOD
844 N. 2280 E.
ROBERTS, ID 83444

DAN GROVER
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SPRINGFIELD, ID 83277

SE/Z CONSTRUCTION
NEIL SCHAFER
P.O. BOX 1469
IDAHO FALLS, ID 83403

FERGUSON 4-T CONSTRUCTION
GREG FERGUSON
P.O. 2316
IDAHO FALLS, ID 83403

NEIL MORGAN
762 WEST HIGHWAY 39
BLACKFOOT , ID 83221

IDAHO GARDENS
MATT REID
436 W. HIGHWAY 26
BLACKFOOT , ID 83221

PRECISION GRADING
DAVE EGAN
POB 3083
IDAHO FALLS, ID 83403

7 Experimental applications under cool (ground tempera-A tures below air temperatures) and hot (ground tempera-percent tures 10 to 20 degrees Fahrenheit higher than air temperatures) conditions have demonstrated that Dimilin-RAATs provides more than 90 percent mortality under this range of thermal conditions. Extensive research in Australia has demonstrated that when ground tempera-Treated tures exceed air temperatures, thermals can limit insecticide deposition of aerial applications unless there are winds of 4 to10 miles per hour (ideally, perpendicular to the swaths).

8 Small-scale trials indicate that 80 to 85 percent mortality also can be achieved using 100-foot swaths with the following rates and coverages: 5 fluid ounces per acre with 33-foot untreated swaths, 6 ounces with 50-foot untreated swaths, and 7 ounces with 100-foot untreated swaths. However, under operational conditions the latter parameters reportedly yielded suboptimal results at high population densities of late nymphal instars and adults in 1999.

The future of RAATs

2000 Research and Development:

- Enhancing the efficacy of RAATs using vegetable oils as carriers of carbaryl and diflubenzuron (Canola oil is an attractant and may function as a feeding stimulant for many rangeland grasshopper species)
- Refining the parameters of a Dimilin-RAATs program, including minimizing total volume, optimizing the oil:water ratio, and identifying the best oil used as a carrier
- Accelerating the optimization of RAATs programs through ecological modeling of the complex biological and physical factors that determine efficacy.

For more information and updates, visit our Web Site at http://sdvc.uwyo.edu/grasshopper/ or contact
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Association for Applied Acridology International and
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P.O. Box 3354
Laramie, WY 82071-3354
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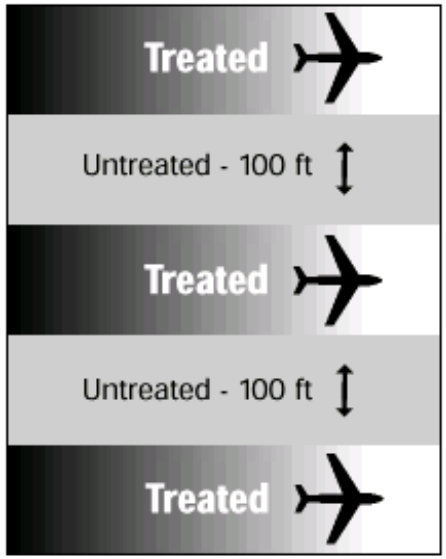
schematic of a RAATs application with 50 percent coverage



Exceptions to the "Rules"

Higher rates or coverages may be needed if grasshopper densities are extreme (more than 50 per square yard), forage cover is tall or dense, or if operational conditions are poor (e.g., ground temperatures exceed air temperatures). In all cases, grasshopper management software (HOPPER or CARMA) should be used to assess a program. Apply insecticides in accordance with label directions and established guidelines for buffers around water, bees, and human habitations.

Do more
less,
using
Reduced Agent
and
Area Treatments (RAATs)

Refining

the newest strategy for rangeland grasshopper management —
an economical and environmental win-win approach to pest management

Attachment 3

Attachment 4

Interface of BLM Administered Public Lands and Private Agriculture Lands

The following information was prepared in support of planning efforts for Idaho's FY 2000 Grasshopper Control program. This information is the result of a GIS analysis of land ownership data from the Idaho Department of Water Resources and agriculture lands information from the Idaho Vegetation and Land Cover Classification System as recommended by the Natural Resources Conservation Service (NRCS). The Bureau of Land Management (BLM) performed the analysis at the Idaho State Office (March 2000).

The analysis identifies the lineal amount (and the number of occurrences) of interface between BLM administered public lands and agriculture lands based on the data provided. The results do not necessarily reflect current crop production on the agriculture lands. Additionally, the interface areas do not imply that there are grasshopper infestation problems in these locations, nor does is it imply that grasshopper control activities are planned for these areas. The data used in this analysis may not reflect recent changes in ownership or agriculture use since these data sets were originally prepared.

County Assessed for Interface	Number of Occurrences	Total Miles of Interface
Ada	110	92
Adams	38	7
Bannock	224	84
Bear Lake	65	30
Bingham	445	273
Blaine	253	111
Boise	9	2
Bonneville	243	129
Butte	134	136
Camas	34	12
Canyon	72	38
Caribou	235	158
Cassia	662	413
Clark	213	157
Custer	397	220
Elmore	397	372
Franklin	78	21
Fremont	112	58
Gem	40	14

County Assessed for Interface	Number of Occurrences	Total Miles of Interface
Gooding	219	135
Jefferson	140	113
Jerome	237	198
Lemhi	564	252
Lincoln	321	217
Madison	77	40
Minidoka	143	143
Oneida	220	90
Owyhee	635	347
Payette	70	30
Power	188	87
Teton	32	18
Twin Falls	415	312
Valley	3	2
Washington	73	21
Total - Southern/Central Idaho Counties	**7,098**	**4,332 miles**

Notes:

1. The ArcInfo grid "Idaho Vegetation and Land Cover Classification System" was developed by Redmond et al.in 1997 and Homer et al in 1998. (Data was recommended to the BLM by the NRCS)

2. The land ownership data was prepared by the Idaho Department of Water Resources at the scale of 1:100K. This data is approximately 10 years old.

3. Because of technical differences between the two data sets, the BLM ownership was buffered by 100 meters to ensure intersection with adjacent agriculture lands.

4. The results are intended to provide an approximate amount of lineal interface between the BLM administered public lands and adjacent agriculture lands.